PE TITLE: Integrated Command & Control Applications

RDT&E BUDGET ITEM J	USTIFIC	CATION	SHEET	(R-2 E)	chibit)		DATE		ry 2000
BUDGET ACTIVITY 05 - Engineering and Manufacturing Deve	elopment		.	•	rated Coi	mmand &	& Contro	I	
COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	2,047	6,055	214	233	252	271	290	Continuing	TBD
652523 Architectural Implementation	47	195	214	233	252	271	290	Continuing	TBD
652524 Reuse and Component Support	2,000	5,860	0	0	0	0	0	0	7,860
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0
(U) A. Mission Description The goal of this program is to dramatically reduce the control (C2) systems by using families of pre-defined by using pre-defined product line architectures with development can improve software quality and relia	ed product lin tested, reusa	es to enhanc ble software	e common a components	pplication u from matur	se and reuse re programs.	. Project 25 The use of	23 minimize common pre	es developme oduct line de	ent cost and time signs during

The goal of this program is to dramatically reduce the development time, costs, and risks associated with the acquisition and development of warfighting command and control (C2) systems by using families of pre-defined product lines to enhance common application use and reuse. Project 2523 minimizes development cost and time by using pre-defined product line architectures with tested, reusable software components from mature programs. The use of common product line designs during development can improve software quality and reliability while reducing fielding times and overall life cycle costs. Project 2524, Reuse and Component Support (RCS) identifies, tests, and provides reusable software components and products to the IC2A program. The RCS project developed a software reuse strategy for the DoD; and is developing a National Product Line Asset Center (NPLACE) Software Reuse Repository (a Congressional special interest item) to manage a command center product line based on primarily commercial off-the-shelf (COTS) products. The IC2A program has determined that over 80% of the functionality of any command center software is common to all command centers. For programs using product line concepts, average savings of 56% in development costs and 66% in development time can be realized.

(U) B. Budget Activity Justification

This program is in budget activity 5 - Engineering and Manufacturing Development, due to the nature of the effort.

(U) <u>C. Program Change Summary (\$ in Thousands)</u>

(U	J) Previous President's Budget (FY 2000 PBR)	2.194	196	216	TBD
(U		2,200	6,096		
(U	, 11 1				
	a. Congressional/General Reductions	-6			

FY 1999

Page 1 of 10 Pages Exhibit R-2 (PE 0604740F)

FY 2001

Total Cos

FY 2000

	RDT&E BUDGET ITEM JUSTIFICATI	ION SHEET (R-2 Exhil	bit)	DATE Febru	ary 2000
	SET ACTIVITY • Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604740F Integrate Applications	ed Command 8		
(U)	C. Program Change Summary (\$ in Thousands) Continued				
	 b. Small Business Innovative Research c. Omnibus or Other Above Threshold Reprogram d. Below Threshold Reprogram e. Rescissions f. Other 	<u>FY 1999</u> -70 -66 -11	<u>FY 2000</u> -41	FY 2001	<u>Total Cos</u>
(U)	Adjustments to Budget Years Since FY 2000 PBR			-2	TBD
(U)	Current Budget Submit/FY 2001 PBR	2,047	6,055	214	TBD
		Page 2 of 10 Pages		Exhibit R-2	2 (PE 0604740F)

RDT&E BUDGET ITEM J	USTIFIC	ATION S	SHEET	(R-2A E	xhibit)		DATE		ry 2000
BUDGET ACTIVITY 05 - Engineering and Manufacturing Deve		PE NUMBER AND TITLE 0604740F Integrated Command & Control Applications					I	PROJECT 652523	
COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
652523 Architectural Implementation	47	195	214	233	252	271	290	Continuing	TBD

(U) A. Mission Description

This project will be renamed Product Lines. This project forms a vital component of the Integrated Command and Control Applications (IC2A) program by providing pre-defined product line architectures with tested, reusable software components to build Command and Control (C2) systems. Using rapid prototyping techniques, a Product Line contractor can quickly tailor a product line to the warfighter's needs and deliver an integrated, combat-ready system. All product lines and components are based on Defense Information Infrastructure Common Operating Environment (DII COE) principles; make maximum use of open system architectures, industry standards, Commercial Off-the Shelf (COTS) products, and government furnished equipment; and incorporate multilevel security (MLS) features. This effort minimizes development risks by reusing proven software components from mature programs and by continuously testing new products and technologies against the product line designs to ensure integration and interoperability. The Product Line contractors develop and maintain the product line infrastructure in a collaborative, synergistic environment using validated, mature software engineering processes to help ensure the quality of the designs and components. Proven product line designs and tested software components reduce development costs, risks, and time for the user. New technologies, capabilities, and incremental developments are assessed and integrated into the designs as part of the product line development process to minimize any impact to the user.

(U) <u>FY 1999 (\$ in Thousands)</u>

(U) \$47 Qualified components for product lines.

(U) \$47 Total

(U) FY 2000 (\$ in Thousands)

(U) \$195 Qualify components for product lines.

(U) \$195 Total

(U) FY 2001 (\$ in Thousands)

(U) \$214 Qualify components for product lines.

(U) \$214 Total

(U) B. Project Change Summary

Project 652523 Page 3 of 10 Pages Exhibit R-2A (PE 0604740F)

	RDT&E BUDGET ITEM JUSTIFIC	CATION	SHEET (R-2A Ex	hibit)		DATE F	ebruary	, 2000	
_	GET ACTIVITY - Engineering and Manufacturing Developmen	t	PE NUMBER 0604740 Applicat	F Integra	and & Co	ntrol			PROJECT 652523	
	C. Other Program Funding Summary (\$ in Thousands) FY 1999 FY 2000 Actual Estimate Not applicable	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate		Cost to mplete	<u>T</u>	otal Cos
(U)	D. Acquisition Strategy All major contracts within this Program Element were awarded a	after full and	open competi	tion.						
(U) (U)	E. Schedule Profile Product Line Component Qualification (Ongoing)	1	FY 1999 2 3 * *		1 2 X X		4 1 X X	<u>FY</u> 2 X	2001 3 X	4 X
	* - Completed Event X - Planned Event This is a support and management level of effort program. All a	activities are	ongoing.							
F	Project 652523	Расе	e 4 of 10 Page	s			Exhih	it R-2A (P	E 06047	740F)

	RDT&E PROC	SRAM ELE	MENT/P	ROJECT C	OST BI	REAKDO	WN (R-3))	DATE F	ebruary 2	2000
=	SET ACTIVITY Engineering and Ma	nufacturing	Developr	ment	=	er and title 40F Integra ations	ated Comi	mand & C	ontrol	-	PROJECT 652523
(U)	A. Project Cost Breakdown		<u>ds</u>)				FY		FY 20		FY 2001
(U) (U)	Product Line Component (Total	Qualification						47 47	19 19		214 214
(U)	B. Budget Acquisition History	ory and Plannin	g Informatio	on (\$ in Thousand	<u>ds</u>)						
(U)	Performing Organizations: Contractor or Government Performing Activity Product Development Organ Hughes Raytheon AGCS TRW Unisys Support and Management Or Not applicable. Test and Evaluation Organization	Contract Method/Type or Funding Vehicle izations CPFF CPFF CPFF CPFF CPFF cPFF cpanizations	Award or Obligation Date 19 Dec 92 19 Dec 92 Dec 94 12 Feb 97 29 Sep 93	Performing Activity EAC N/A N/A N/A N/A N/A N/A	Project Office EAC N/A N/A N/A N/A	Total Prior to FY 1999 453 1,000 50 0 30	Budget FY 1999 15 16 0 16 0	Budget FY 2000 65 65 0 65 0	Budget FY 2001 71 72 0 71 0	Budget to Complete Continuing Continuing 0 Continuing	Program TBD TBD 50
(U)	Item Description Product Development Proper Not applicable. Support and Management Pro-	Contract Method/Type or Funding Vehicle	Award or Obligation Date	<u>Delivery</u> <u>Date</u>		Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	
Р	roject 652523			Pag	e 5 of 10 Pa	ges			Exhil	oit R-3 (PE	0604740F)

RDT&E PROGRAM ELEMENT/PROJEC	CT COST BREAKDO	WN (R-3))	DATE F (DATE February 2000			
BUDGET ACTIVITY 05 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604740F Integra Applications	PROJECT						
(U) Government Furnished Property Continued: Test and Evaluation Property Subtotals Subtotal Product Development Subtotal Support and Management Subtotal Test and Evaluation Total Project	Total Prior to FY 1999 1,533 1,533	Budget FY 1999 47 47	Budget FY 2000 195	Budget FY 2001 214 214	Budget to Complete TBD TBD	Tota Program TBE		
Project 652523	Page 6 of 10 Pages			Exhib	it R-3 (PE 06	04740F)		

RDT&E BUDGET ITEM J	USTIFIC	ATION S	SHEET	(R-2A E	xhibit)		DATE		ary 2000
BUDGET ACTIVITY 05 - Engineering and Manufacturing Dev		PE NUMBER AND TITLE 0604740F Integrated Command & Control Applications					I	PROJECT 652524	
COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
652524 Reuse and Component Support	2,000	5,860	0	0	0	0	0	0	7,860

(U) A. Mission Description

This project identifies, tests, and provides reusable software components and products for use by Air Force and Department of Defense program offices. A software reuse strategy for DoD was developed as part of this effort. Efforts are continuing with development of a Product Line Asset Center Software Reuse Repository to manage a command center product line based primarily on commercial off-the-shelf (COTS) products through the National Product Line Asset Center (NPLACE) contract vehicle.

(U) FY 1999 (\$ in Thousands)

(U) \$360 Identified Enterprise Wide Assets (From COTS, GOTS, Product line engineering centers).
 (U) \$1,396 Performed suitability testing against product line architectures, assets, criteria, and design.
 (U) \$244 Maintained repository/distribute product line architecture, assests, criteria, and design.

(U) \$2,000 Total

(U) FY 2000 (\$ in Thousands)

(U) \$2,780 Asset Software Reuse Program

(U) \$2,580 National Product Line Asset Center (NPLACE)

(U) \$500 Air Force Product Line Engineering

(U) \$5,860 Total

(U) FY 2001 (\$ in Thousands)

(U) \$0 No Activity (U) \$0 Total

(U) B. Project Change Summary

Congress added \$5.9 million in FY00 for Asset Software Reuse Program \$2.8 million), National Product Line Asset Center (NPLACE)(\$2.6 million), and Air Force Product Line Engineering (\$0.5 million).

Project 652524 Page 7 of 10 Pages Exhibit R-2A (PE 0604740F)

	RDT&E BUI	OGET ITEN	/ JUSTIF	ICATION	SHEET (R-2A Ex	hibit)		DATE Februar	y 2000
	GET ACTIVITY - Engineering and Man	ufacturing [)evelopme	nt	PE NUMBER 0604740 Applicat	F Integra	ted Comma	ınd & Coı	ntrol	PROJECT 652524
	C. Other Program Funding S Not applicable	Summary (\$ in 7 FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
(U)	D. Acquisition Strategy Not applicable.									
(U)	E. Schedule Profile			1	<u>FY 1999</u> 2 3	4	FY 2	2 <u>000</u> 3 4		<u>2001</u> 3 4
(U)	Not applicable.			1	2 3	-	1 2	3 7	. 1 2	3 4
F	roject 652524			Pag	ge 8 of 10 Pages	3			Exhibit R-2A (F	PE 0604740F)

	RDT&E PRO	GRAM ELE	MENT/F	PROJECT C	OST B	REAKDO	WN (R-3)	1	DATE F e	ebruary 20	000
	GET ACTIVITY - Engineering and M				PE NUME 06047	BER AND TITLE 40F Integrations	, ,		•		PROJECT 652524
(U)	A. Project Cost Breakdov	vn (\$ in Thousan	<u>ds</u>)								
							FY :		FY 200		FY 2001
(U)	Enterprise-wide Asset Iden							360	2,78		0
(U)	Product Line Suitability Te	esting (NPLACE)					· · · · · · · · · · · · · · · · · · ·	396	2,58		0
(U)	Product Line Engineering							244	50		0
(U)	Total Congress added \$5.9 million	on in EVOO for As	cat Cafturara	Dauga Bragram \$2	9 million)	National Produ		000 Cantar (NDL)	5,86		0 ir Force
	Product Line Engineering		set Software	Reuse Program \$2	.8 111111011),	National Produ	ict Line Asset	Center (NPL)	ACE)(\$2.0 III	illioli), alid A	ir Force
(T.T)			T 6 4	(h • 70)	1.						
(U)	B. Budget Acquisition His		<u>ig informati</u>	on (\$ in 1 nousand	<u>us)</u>						
(U)	Performing Organization										
	Contractor or	Contract									
	Government	Method/Type	Award or	Performing	<u>Project</u>						
	Performing	or Funding	<u>Obligation</u>	<u>Activity</u>	Office FAC	Total Prior	Budget	Budget	Budget	Budget to	<u>Total</u>
	Activity Development Organization	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	to FY 1999	<u>FY 1999</u>	<u>FY 2000</u>	FY 2001	<u>Complete</u>	<u>Program</u>
	Product Development Orga	<u>nizations</u> NPLACE	18 Nov 96	N/A	N/A	0	1 670	2.600	0	0	4 272
	West Virginia High Technology Center	NPLACE	18 NOV 90	N/A	N/A	0	1,672	2,600	0	0	4,272
	Raytheon/Hughes/TRW	CPFF	20 Feb 97	N/A	N/A	0	328	3,260	0	0	3,588
	Support and Management (2010077	IV/PX	14/14	O	320	3,200	U	O	3,300
	Not applicable.	<u>Jigam Patrons</u>									
	Test and Evaluation Organi	zations									
	Not applicable.										
(U)	Government Furnished P	roperty:									
		Contract									
		Method/Type	Award or								
	<u>Item</u>	or Funding	Obligation	<u>Delivery</u>		Total Prior	Budget	Budget	Budget	Budget to	<u>Total</u>
	Description	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>		to FY 1999	FY 1999	FY 2000	FY 2001	Complete	<u>Program</u>
F	Project 652524			Рас	e 9 of 10 Pa	iges			Exhih	it R-3 (PE 06	S04740F)
<u> </u>	10,000 002027			1 ag	C / 01 10 1 t	1800			LAHID		70 11 401)

RDT&E PRO	OGRAM ELI	EMENT/F	ROJECT	COST B	REAKDO	WN (R-3))	DATE F e	ebruary 20	00
BUDGET ACTIVITY 05 - Engineering and I	Manufacturino	g Developi	ment	=	er and title 10F Integra ations	PROJECT 65252				
(U) Government Furnished Item Description	Contract Method/Type or Funding	Award or Obligation	<u>Delivery</u>		Total Prior to FY 1999	<u>Budget</u> FY 1999	Budget FY 2000	Budget FY 2001	Budget to	<u>Tota</u>
Description Product Development Pro Not applicable. Support and Management Test and Evaluation Prop	t Property	<u>Date</u>	<u>Date</u>			<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	Complete	<u>Progran</u>
Subtotals Not applicable.					Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	<u>Tota</u> <u>Progra</u> i
Subtotal Product Develop Subtotal Support and Mar Subtotal Test and Evaluat	nagement				0	2,000	5,860	0	0	7,860
Total Project					0	2,000	5,860	0	0	7,860
Project 652524			I	Page 10 of 10 Pa	nges			Exhib	it R-3 (PE 06	04740F)